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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/448,144	11/24/1999	MASAHIRO SAITOU	0039-7444-0T	4711

22850 7590 04/15/2002

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EXAMINER

MERCADO, JULIAN A

ART UNIT	PAPER NUMBER
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1745

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DATE MAILED: 04/15/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/448,144

Applicant(s)

SAITOU ET AL.

Examiner

Julian A. Mercado

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 11 February 2002.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) 6-15 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5, 16 and 17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

## DETAILED ACTION

### *Remarks*

This Office Action is responsive to Applicant's amendment filed February 11, 2002.

The rejection of claims 1-5 under 35 U.S.C. 112, second paragraph has been withdrawn.

### *Claim Rejections - 35 USC § 112*

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 3 is rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

As discussed in the previous Office Action, claim 3 recites the peeling resistance layer and corrosion resistance layer made as one layer. The specification, however, does not enable the skilled artisan how to make the discrete layers as one combined layer. The examiner had cited page 27 of the specification as merely literal support for the instant limitation. For this reason, Applicant's response, in directing the examiner's attention to the same section of specification (page 27 line 14 to page 28 line 3) is therefore found inadequate to obviate this ground of rejection. Citation of Figure 2 is noted, however the Figure is noted to show not one layer but rather three discrete layers.

***Claim Rejections - 35 USC § 102 and 103***

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1, 4, 5 and 16 are rejected under 35 U.S.C. 102(e) as being anticipated by Hwang *et al.*

The rejection is maintained for the reasons of record and for the additional reasons to follow.

Claims 1, 4, 5 and 16 are rejected under 35 U.S.C. 102(e) as being anticipated by or, in the alternative (new rejection), under 35 U.S.C. 103(a) as obvious over Hiermaier *et al.*

The rejection is maintained for the reasons of record and for the additional reasons to follow.

Regarding the above rejections, Applicant's amendment to the present claims is noted to have been submitted so as to obviate the ground of rejection based on 35 U.S.C. 112, second paragraph (now withdrawn). The scope of the present claims is substantially of identical scope to that which was considered in the previous Office Action.

Applicant's arguments have been fully considered, however they are not persuasive.

The examiner notes, for clarity of the record, that claim 1 (the sole independent claim) recites "said multi-coating layer including *at least two* layers selected from the group consisting of a low electric resistance layer, a corrosion resistance layer and a peeling resistance layer". [emphasis added] Hwang is maintained under 35 U.S.C. 102 (e) for teaching at least two layers, i.e. two members of the claimed Markush group. Hwang is not relied upon to teach a low

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electric resistance layer as one of the “at least two layers”. As to the limitation in claim 1 drawn to “an electric resistance of equal to or lower than  $1000\mu\Omega\text{cm}^2$ ”, this limitation within the ground of rejection based on Hwang is not given patentable weight since Hwang is relied upon to satisfy the other two layers of the “at least two layers” Markush group; the resistance value in  $\mu\Omega\text{cm}^2$  is a property which only gives breadth or meaning to the low electric resistance layer.

Applicant submits that Hwang and Hiermaier, in teaching molten carbonate fuel cells, are not proton exchange fuel cells such as, e.g. a solid polymer electrolyte fuel cell. In this regard, Applicant is correct. The examiner regrets any mischaracterization of the Hwang and Hiermaier references as proton exchange fuel cells. However, the rejection based on these references are maintained for the reasons of record, as the preamble recitation of a “proton exchange fuel cell” is not requisitely given the effect of a limitation in the claim. The preamble appears to be only directed to the purpose or intended use of the separator, and the additional components of the claim(s) can stand alone without depending on the preamble for completeness.

Regarding Hwang, Applicant submits that the Al used in the coating layer has a low corrosion protecting property which “may dissolve out of the substrate”. The examiner notes that this line of argument was not provided with column and line citations of the Hwang reference in support thereof. The examiner has found no teaching, implicit or otherwise, in the Hwang reference which states that the Al used in the coating layer has a low corrosion protecting property. Applicant’s argument appears speculative. Additionally, the Hwang reference was found absent of any teaching that the Al coating may dissolve out of the substrate. To the contrary, Hwang teaches that the Al layer, in combination with Ni, results in a coated layer on

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the separator. (col. 4 lines 17-21) In coating with an Al layer, an anticorrosive coating is performed. (col. 4 line 40)

As to a peel-resistance layer, as discussed in the previous Office Action Hwang teaches silver as a bonding material and notably having a thickness of 10 to 50  $\mu\text{m}$ . It would naturally flow that a bonding material would also function as a peel-resistance layer. The examiner notes that on page 29 of the specification, Applicant discloses “[a]t the Ni layer thereunder, the adhesion strength with the Au layer is improved and the peeling of the [Au] coating is prevented”. Thus, in Hwang the silver layer underlaying the aluminum layer, in improving adhesion strength, would similarly prevent peeling of the aluminum layer in functioning as a peel-resistant layer.

Applicant submits that Hiermaier does not teach a low electric resistance layer and a peeling resistance layer. This argument is not persuasive. As discussed in the previous Office Action, the disclosed metals of Ag, Au, Cu and Ni are reasonably presumed to be of low contact resistance as these metals are the same as those claimed by Applicant. Thus, the disclosed metals would inherently comprise the instant low electric resistance layer. As to Hiermaier teaching an electric resistance of equal to or lower than  $1000\mu\Omega\text{cm}^2$ , as Hiermaier teaches the same metals for the low electric resistance layer, it would reasonably follow that the layer would inherently have the same electric resistance value as claimed by Applicant. Alternatively, the skilled artisan would find obvious to employ the low electric resistance value claimed by Applicant, as Hiermaier specifically teaches that the layers are desired to have “good electrical conductivity”. (col. 2 line 23) The examiner notes that the amendment to claim 1 in reciting the electric resistance value of “equal to or lower than  $1000\mu\Omega\text{cm}^2$ ” appears to have been submitted

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merely to obviate a ground of rejection under 35 U.S.C. 112, second paragraph. Applicant is also noted to make no specific argument as to Hiermaier not teaching or suggesting an electric resistance value of equal to or lower than  $1000\mu\Omega\text{cm}^2$ . As to a peeling resistance layer, as discussed in the previous Office Action, Hiermaier's disclosure that the Ag layer prevents oxide formation is considered to render this layer a peeling resistant layer, in that the prevention of oxygen diffusion results in minimization of corrosion. The Ag layer is, in fact, specifically referenced as a "corrosion proofing coating". (Col. 4 line 38) This teaching by the patentees that the Ag layer is "corrosion proofing" is found consistent with Applicant's disclosure as found on page 29 lines 4-20, wherein prevention of corrosion is disclosed as one of the properties of the peeling resistant layer.

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hiermaier *et al* in view of Hwang *et al*.

The rejection is maintained for the reasons of record. Applicant's argument against this ground of rejection appears to be directed solely to this claim being dependent on claim 1, and therefore this claim will stand or fall together with claim 1. As the rejection of claim 1 based on Hiermaier is maintained above, the rejection of claim 2 based on Hiermaier in view of Hwang is maintained for the reasons discussed in the previous Office Action.

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hwang *et al* in view of Hiermaier *et al*.

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The rejection is maintained for the reasons of record. Applicant's argument against this ground of rejection appears to be directed solely to this claim being dependent on claim 1, and therefore this claim will stand or fall together with claim 1. As the rejection of claim 1 based on Hwang is maintained above, the rejection of claim 2 based on Hwang in view of Hiermaier is maintained for the reasons discussed in the previous Office Action.

Claim 1 (new rejection) is rejected under 35 U.S.C. 103(a) as being unpatentable over Takada et al. (U.S. Pat. 5,460,896).

Takada teaches a separator [19] having a multi-coating layer formed thereon. (Figure 1) Among the layers formed thereon is a low electric resistance layer [14] and a corrosion resistance layer [13]. (Col. 4 lines 43-46)

Takada does not explicitly teach the low electric resistance layer to have an electrical resistance equal to or less than  $1000 \mu \Omega \text{cm}^2$ . However, absent of unexpected results it is asserted that these are optimizable parameters for result-effective variables. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980) The skilled artisan would find obvious to employ the instant resistance value for the electric resistance value, as Takada specifically teaches that the thickness thereof is desired to be optimized, i.e. made thinner and to have an increased surface area, in order to decrease the electrical resistance. (Col. 4 lines 61-67)

Claim 17 (new rejection) is rejected under 35 U.S.C. 103(a) as being unpatentable over Hwang as applied to claims 1, 4, 5 and 16 above.

The teachings of Hwang are discussed above.



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Claim 17 now requires that the peeling resistance layer consists of nickel. In claiming a peeling-resistance layer of nickel, claim 17 appears to be an attempt to distinguish the claimed invention from the examiner's finding of the Ag layer in Hwang's invention as a peel resistance layer. Upon further consideration of Hwang's teachings as a whole, the nickel layer is reasonably construed as a peeling-resistance layer. Hwang employs a thermal diffusion process which results in increased bonding between mutually contacting layers such as the nickel layer [52] and the base material [50]. The result is a reinforced bonding between the base material and the nickel layer. (Col. 4 lines 17-21) Thus, the skilled artisan would find obvious that due in part to the reinforced bonding between the base material and the nickel layer deposited thereon, the nickel layer functions as a peeling resistance layer. The scope of claim 17 allows for the nickel layer and aluminum layer as disclosed in Hwang's invention to read on the instant peeling-resistance layer and corrosion resistance layer, respectively.

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

This application contains claims drawn to an invention nonelected with traverse in Paper No. 10. A complete reply to the final rejection must include cancelation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after

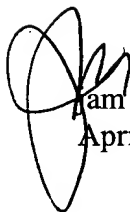
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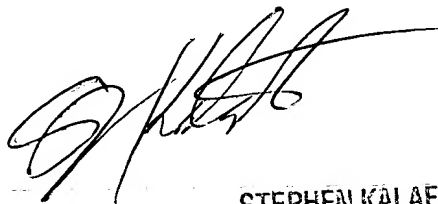
the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Julian A. Mercado whose telephone number is (703) 305-0511. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan, can be reached on (703) 308-2383. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-3599 for regular communications and (703) 305-3599 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

 am  
April 11, 2002



STEPHEN KALAFUT  
PRIMARY EXAMINER  
GROUP

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